SECTION 07 42 63.01 00

FABRICATED WALL PANEL ASSEMBLIES

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION (AAMA)

AAMA 501.2	(2015) Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls and Sloped Glazing Systems
AAMA 621	Voluntary Specifications for High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (hdg) and Zinc-Aluminum Coated Steel Substrates

AMERICAN IRON AND STEEL INSTITUTE (AISI)

AISI S100	(2012) North American Specification for the Design of Cold-Formed Steel Structural Members

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)

ASCE 7	(2010; Errata 2011; Supp 1 2013) Minimum Design Loads for Buildings and Other Structures

ASTM INTERNATIONAL (ASTM)

ASTM A463/A463M	(2010; R 2015) Standard Specification for Steel Sheet, Aluminum-Coated, by the Hot-Dip Process
ASTM A653/A653M	(2015) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A755/A755M	(2015) Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products
ASTM A792/A792M	(2010) Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process

ASTM B117	(2011) Standard Practice for Operating Salt Spray (Fog) Apparatus
ASTM C1311	(2014) Standard Specification for Solvent Release Agents
ASTM C273/C273M	(2011) Shear Properties of Sandwich Core Materials
ASTM C518	(2010) Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
ASTM C591	(2015) Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation
ASTM C920	(2014a) Standard Specification for Elastomeric Joint Sealants
ASTM D1308	(2013) Effect of Household Chemicals on Clear and Pigmented Organic Finishes
ASTM D1621	(2010) Compressive Properties of Rigid Cellular Plastics
ASTM D1622/D1622M	(2014) Apparent Density of Rigid Cellular Plastics
ASTM D1623	(2009) Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics
ASTM D1929	(2014) Standard Test Method for Determining Ignition Temperature of Plastics
ASTM D2126	(2009) Response of Rigid Cellular Plastics to Thermal and Humid Aging
ASTM D2244	(2015a) Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates
ASTM D2247	(2011) Testing Water Resistance of Coatings in 100% Relative Humidity
ASTM D2794	(1993; R 2010) Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
ASTM D3359	(2009; E 2010; R 2010) Measuring Adhesion by Tape Test
ASTM D3363	(2005; E 2011; R 2011; E 2012) Film Hardness by Pencil Test
ASTM D4214	(2007; R 2015) Standard Test Method for Evaluating the Degree of Chalking of

Exterior Paint Films

ASTM D522/D522M (2014) Mandrel Bend Test of Attached Organic Coatings

ASTM D523 (2014) Standard Test Method for Specular Gloss

ASTM D6226 (2010) Standard Test Method for Open Cell Content of Rigid Cellular Plastics

ASTM D714 (2002; R 2009) Evaluating Degree of Blistering of Paints

ASTM D790 (2016) Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials

ASTM D822 (2001; R 2006) Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings

ASTM D968 (2015) Abrasion Resistance of Organic Coatings by Falling Abrasive

ASTM E283 (2004; R 2012) Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen

ASTM E331 (2000; R 2009) Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference

ASTM E84 (2015a) Standard Test Method for Surface Burning Characteristics of Building Materials

ASTM G152 (2013) Operating Open Flame Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials

ASTM G153 (2013) Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials

FM GLOBAL (FM)

FM 4880 Class 1 Fire Rating of Insulated Wall or Wall and Roof/Ceiling Panels, Interior Finish Materials or Coating and Exterior Wall Systems

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 259 (2013) Standard Test Method for Potential Heat of Building Materials

NFPA 285	(2012) Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components

SCIENTIFIC CERTIFICATION SYSTEMS (SCS)

SCS	Scientific Certification Systems (SCS)Indoor Advantage

SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)

SMACNA 1793	(2012) Architectural Sheet Metal Manual, 7th Edition

UL ENVIRONMENT (ULE)

ULE Greenguard	UL Greenguard Certification Program

UNDERWRITERS LABORATORIES (UL)

UL 580	(2006; Reprint Oct 2013) Tests for Uplift Resistance of Roof Assemblies
UL Bld Mat Dir	(2012) Building Materials Directory

1.2 RELATED REQUIREMENTS

Refer to Section 01 91 00.01 15 TOTAL BUILDING COMMISSIONING and 01 91 19.01 00 EXTERIOR ENCLOSURE COMMISSIONING for general Cx process requirements, definition of Cx team members, and delineation of responsibilities.

1.3 DEFINITIONS

Fabricated Wall Panel Assembly: Metal wall panels, attachment system components, thermal insulation, and accessories shop fabricated for a complete weather-tight wall system.

1.4 DESCRIPTION OF FABRICATED WALL PANEL ASSEMBLY SYSTEM

Factory color finished, galvalume metal wall panel system with concealed fastening attachment. Panel profile must be **AM#10... smooth (non-embossed) ribs with vertical-linear striations not to exceed dimensions as follows: 0.75-inch wide at spacing of 3 inches on center. ...AM#10** Interior finish of panel assembly to be factory color finished galvalume with embossed finish and recessed stiffener beads.

1.4.1 Metal Wall Panel General Performance

Comply with performance requirements, conforming to AISI S100, without failure due to defective manufacture, fabrication, installation, or other defects in construction. Wall panels, prefabricated canopies over entrances and accessory components must conform to the following standards:

ASTM A463/A463M for aluminum coated steel sheet
ASTM A755/A755M for metallic coated steel sheet for exterior coil

pre-painted applications.
ASTM C273/C273M
ASTM D522/D522M for applied coatings
UL Bld Mat Dir

1.4.2 Structural Performance

Maximum calculated fiber stress must not exceed the allowable value in the AISI or AA manuals; a one third overstress for wind is allowed. Midspan deflection under maximum design loads is limited to L/180. Contract drawings show the design wind loads and the extent and general assembly details of the metal siding. Contractor must provide design for members and connections not shown on the drawings. Siding panels and accessories must be the products of the same manufacturer.

Wall systems and attachments are to resist the wind loads as determined by UL 580 and ASCE 7 in the geographic area where the construction will take place, in pounds per square foot. Submit five copies of wind load tests and seismic tests to the Contracting Officer.

Provide metal wall panel assembly for seismic conditions complying with the applicable requirements of ASCE 7, Section 13.

1.4.3 Air Infiltration

Air leakage must conform to the limits through the wall assembly area when tested according to ASTM E283.

1.4.4 Water Penetration Under Static Pressure

No water penetration when tested according to ASTM E331.

1.4.5 Thermal Properties

The panel shall provide a nominal R-value of 7.2 (hr/ft2/°F/Btu) per inch thickness when tested in accordance with ASTM C518 at 75°F mean temperature and 8.0 (hr/ft2/°F/Btu) per inch thickness when tested in accordance with ASTM C518 at 35°F mean temperature.

1.4.6 Fatigue Test

There shall be no evidence of metal/insulation interface delamination when the panel is tested by simulated wind loads (positive and negative loads), when applied for two million alternate cycles of L/180 deflection.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. Submittals with an "S" designation following the "G" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29.01 00 SUSTAINABILITY REPORTING. Other designations following the "G" designation identify the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00.01 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Qualification of Manufacturer; G J

Qualification of Installer; G J

SD-02 Shop Drawings

Fabrication and Installation drawings for the following items are to indicate completely dimensioned structural frame and erection layouts, openings in the wall, special framing details, and construction details at corners, building intersections and flashing, location and type of mastic and metal filler strips.

Wall Panel Assemblies; G JC
Flashing and Accessories; G JC
Anchorage Systems; G JC
Canopies; G JC

SD-03 Product Data

Certification; G JC

Submit Manufacturer's catalog data for the following items:

Factory Color Finish; G JC
Closure Materials; G JC
Insulation; G JC
Pressure Sensitive Tape; G JC
Sealants and Caulking; G JC
Accessories; G JC
Canopies; G JC
Recycled Content; G JS
Local/Regional Materials; G JS

SD-04 Samples

Wall Panel Assemblies; G J
12 inches long by actual panel width
Fasteners; G J
Metal Closure Strips; G J
10 inches long of each type
Insulation; G J
approximately 8 by 11 inches

Manufacturer's color charts and chips; G J
Provide approximately 4 by 4 inches, showing full range of colors, textures and patterns available for wall panels with factory applied finishes.

SD-05 Design Data

Structural analysis; G J
Provide analysis for Canopies and wall systems
wind design analysis; G J

SD-06 Test Reports

Water Leakage Tests; G J
wind load tests; G J
seismic tests; G J

Factory Color Finish Performance Requirements

SD-07 Certificates

Submit certificates for the following items showing conformance with referenced standards contained in this section:

Fasteners; G J
Enamel Repair Paint; G J

Provide evidence that products used within this specification are manufactured in the United States.

Qualification of Manufacturer; G J

Qualification of Installer; G J

SD-08 Manufacturer's Instructions

Installation of Wall panels; G JC

Installation of Canopies; G JC

Include detailed application instructions and standard manufacturer drawings altered as required by these specifications. Explicitly identify in writing, differences between manufacturer's instructions and the specified requirements.

SD-11 Closeout Submittals

Warranty; G J
Include copies of Material Safety Data Sheets; G JC
for maintenance/repair materials.

20 year "Water-Tight" warranty; G JC
for labor and materials.

1.6 QUALITY ASSURANCE

1.6.1 Pre-Installation Conference

After submittals are received and approved but before wall panel and insulation work, including associated work, is performed, the Contracting Officer will hold a pre-siding conference to review the following:

a. The drawings, including Fabrication and Installation drawings, showing complete Wall Panel Assemblies, and specifications.
Include details for the following for review:

flashing and accessories
Canopy attachment
anchorage systems
manufacturer's catalog data
Factory Color Finish

Submit manufacturer's color charts and chips, approximately 4 by 4 inches, showing full range of colors, textures and patterns available for wall panels with factory applied finishes.

Closure Materials, including metal closure strips.

Insulation
Pressure Sensitive Tape
Accessories
Fasteners
Canopies

b. Finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

c. Methods and procedures related to metal wall panel and canopies installation, including manufacturer's written instructions for Installation of Wall panels and Installation of Canopies, and verification of wall system assembly and canopies wind load and fire rating classification listings.

d. Support conditions for compliance with requirements, including alignment between and attachment to structural members. Provide structural analysis including details of wind design analysis including wind speed, exposure category, co-efficient, importance factor, designates type of facility, negative pressures for each zone, methods and requirements of attachment. Wind design analysis to include wall and canopy plan delineating dimensions and attachment patterns for each zone. Wind design analysis to be prepared and sealed by Licensed Project Engineer in the geographic area where the construction will take place.

e. Flashing, special siding details, wall penetrations, canopies, openings, and condition of other construction that will affect metal wall panels.

f. Governing regulations and requirements for insurance, certificates, tests and inspections if applicable. Include certification for sustainable acquisition and wall system assembly and canopies wind load and fire rating classification. Safety plan review must include applicable Material Safety Data Sheets.

g. Temporary protection requirements for metal wall panel assembly and canopies during and after installation.

h. Wall panel and canopies observation and repair procedures after metal wall panel installation. Include review of sample Enamel Repair Paint.

i. Sample 20 year "Water-Tight" warranty.

1.6.2 Manufacturer's Technical Representative

The representative must have authorization from manufacturer to approve field changes and be thoroughly familiar with the products and installations in the geographical area where construction will take place.

1.6.3 Qualification of Manufacturer

Metal wall panel system and canopy manufacturers must have:

a. A minimum of five (5) years experience in manufacturing metal wall system and accessory products.

b. Provide engineering services by an authorized engineer; currently

licensed in the geographical area where construction will take place, having a minimum of four (4) years experience as an engineer knowledgeable in wind load design analysis, protocols and procedures for the ASCE 7.

c. Provide certified engineering calculations using the products submitted for:

Wind load requirements in accordance with FM Wind Design Guide and ASCE 7.

1.6.4 Qualification of Installer

The installation contractor must be approved and certified by the wall panel manufacturer prior to beginning the installation of the metal wall system.

1.6.5 Single Source

Obtain each type of metal wall and liner panels, clips, closures and other accessories from the standard products of the single source from a single manufacturer to operate as a complete system for the intended use.

1.6.6 Surface-Burning Characteristics

Provide metal wall panels having insulation core material with the following surface-burning characteristics as determined by testing identical products according to ASTM E84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

a. Flame-Spread Index: 25 or less.

b. Smoke-Developed Index: 450 or less.

1.6.7 Fire-Resistance Ratings

Steel-faced panels with polyisocyanurate (ISO) core shall fully comply with Chapter 26 of International Building Code regarding the use of Foam Plastic.

a. FM 4880: Class I rated per FM Global, panels are approved for use without a thermal barrier and do not create a requirement for automatic sprinkler protection.

b. NFPA 285 Intermediate Scale Multi-story Fire Evaluation; successfully passed acceptance criteria.

c. ASTM D1929 Minimum Flash and Self Ignition; established for foam core.

d. NFPA 259 Potential Heat Content; established for foam core.

e. S101, S102, S127 UL Canada fire test standards; successfully passed.

1.6.8 Fabrication

Fabricate and finish metal wall panels, canopies and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes and as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.

Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

Fabricate metal wall panel side laps with factory-installed captive gaskets or separator strips that provide a air-tight seal and prevent metal-to-metal contact, in a manner that will seal weather-tight and minimize noise from movements within panel assembly.

1.6.8.1 Sheet Metal Accessories

Fabricate flashing and trim to comply with recommendations in SMACNA 1793 that apply to the design, dimensions, metal, and other characteristics of item indicated:

a. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.

b. End Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.

c. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.

d. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.

e. Fabricate cleats and attachment devices of size and metal thickness recommended by SMACNA or by metal wall panel manufacturer for application, but not less than thickness of metal being secured.

1.6.9 Finishes

Comply with AAMA 621 for recommendations for applying and designating finishes.

Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

1.6.10 Sustainable Design Certification

Product shall be third party certified in accordance with ULE Greenguard, SCS Scientific Certification Systems Indoor Advantage or equal. Certification shall be performed annually and shall be current.

1.7 DELIVERY, HANDLING, AND STORAGE

Deliver and package components, sheets, metal wall panels, and other manufactured items so as not to be damaged or deformed and protected during transportation and handling.

Unload, store, and erect metal wall panels in a manner to prevent bending, warping, twisting, and surface damage.

Stack and store metal wall panels horizontally on platforms or pallets, covered with suitable weather-tight and ventilated covering to ensure

dryness, with positive slope for drainage of water. Do not store metal wall panels in contact with other materials that might cause staining, denting, or other surface damage.

Retain strippable protective covering on metal wall panel for period of metal wall panel installation.

Protect foam-plastic insulation as follows:

a. Do not expose to sunlight, except to extent necessary for period of installation and concealment.

b. Protect against ignition at all times. Do not deliver foam-plastic insulation materials to Project site before installation time.

Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

1.8 PROJECT CONDITIONS

Weather Limitations: Proceed with installation preparation only when existing and forecasted weather conditions permit Work to proceed without water entering into existing walling system or building.

Field Measurements: Verify locations of wall framing and opening dimensions by field measurements before metal wall panel and canopies fabrication and indicate measurements on Shop Drawings.

1.9 WARRANTY

Furnish manufacturer's water-tight warranty for the metal wall panel system. The warranty period is to be no less than twenty (20) years from the date of Government acceptance of the work. The warranty is to be issued directly to the Government. The warranty is to provide that if within the warranty period the metal wall panel system shows evidence of corrosion, perforation, rupture or excess weathering due to deterioration of the wall panel system resulting from defective materials and correction of the defective workmanship is to be the responsibility of the metal wall panel system manufacturer. Repairs that become necessary because of defective materials and workmanship while metal wall panel system is under warranty are to be performed within 24 hours after notification, unless additional time is approved by the Contracting Officer. Failure to perform repairs within 24 hours of notification will constitute grounds for having emergency repairs performed by others and not void the warranty.

1.10 SUSTAINABLE DESIGN REQUIREMENTS

1.10.1 Recycled Content

Use materials or products where recycled content is clearly identifiable by the manufacturer, indicating the total sum of post-consumer recycled content, plus one-half of the pre-consumer content. See Section 01 33 29.01 00 SUSTAINABILITY REPORTING for cumulative total recycled content requirements.

1.10.2 Local/Regional Materials

Use materials or products extracted, harvested, or recovered, as well as manufactured, within a 500 mile radius from the project site, if available

from a minimum of three sources. See Section 01 33 29.01 00 SUSTAINABILITY REPORTING for cumulative total local material requirements.

PART 2 PRODUCTS

2.1 PANEL MATERIALS

2.1.1 Steel Sheet

Roll-form steel wall and liner panels to the specified profile, 22 gauge exterior skins and 24 gauge interior skins and depth as indicated. Material must be plumb and true, and within the tolerances listed:

a. Aluminum-Zinc Alloy-coated Steel Sheet conforming to ASTM A792/A792M.

b. Individual panels to have continuous length to cover the entire length of any unbroken wall area with no joints or seams and formed without warping, waviness, or ripples that are not part of the panel profile and free of damage to the finish coating system.

c. Provide panels with thermal expansion and contraction consistent with the type of system specified.

1. Profile and coverage to be a minimum height and width from manufacturer's standard for the indicated wall area.

2. **AM#10... Smooth (non-embossed) ribs with vertical-linear striations not to exceed dimensions as follows: 0.125 inches deep by 0.75 inches wide at spacing of 3 inches on center. ...AM#10**

3. Panel width as indicated on drawings.

2.1.2 Foam-Insulation Core Wall Panel

Provide factory-formed steel wall panel assembly fabricated from two sheets of metal with modified polyisocyanurate foam insulation core board during fabrication with joints between panels designed to form weather-tight seals. Include accessories required for weather-tight installation. Insulation to conform to ASTM C591, Type IV, CFC and HCFC free. compliant with Montreal Protocol and Clean Air Act.

a. Closed-Cell Content: 88 percent when tested according to ASTM D6226.

b. Density: 2.3 to 2.6 lb/cu. ft. when tested according to ASTM D1622/D1622M.

c. Compressive Strength: Minimum 20 psi when tested according to ASTM D1621.

d. Shear Strength: 25 psi when tested according to ASTM C273/C273M.

e. Compressive Stress when tested in accordance with ASTM D1621.

1. Parallel to Rise: minimum of 19 psi.
2. Perpendicular to Rise: 23 psi.

f. Shear Stress: Minimum of 25 psi when tested in accordance with ASTM C273/C273M.

g. Tensile Stress: Minimum of 23 psi when tested in accordance with ASTM D1623.

h. Dimensional Stability when tested in accordance with ASTM D2126:

1. High Temperature Aging at 158 deg. F and plus 100 percent relative humidity for 14 days: less than 6 percent volume change.

2. High Temperature Aging at 212 deg. F and ambient humidity for 14 days: less than 4 percent volume change.

3. Low Temperature Aging at minus 40 deg. F and ambient humidity at 14 days: one percent volume change.

2.1.3 Finish

All panels are to receive a factory-applied polyvinylidene fluoride Kynar 500/Hylar 5000 finish consisting of a baked-on top-coat with a manufacturer's recommended prime coat conforming to the following:

a. Metal Preparation: All metal is to have the surfaces carefully prepared for painting on a continuous process coil coating line by alkali cleaning, hot water rinsing, application of chemical conversion coating, cold water rinsing, sealing with acid rinse, and thorough drying.

b. Prime Coating: A base coat of epoxy paint, specifically formulated to interact with the top-coat, is to be applied to the prepared surfaces by roll coating to a dry film thickness of 0.20 plus 0.05 mils. This prime coat must be oven cured prior to application of finish coat.

c. Exterior Finish Coating: Apply the finish coating over the primer by roll coating to dry film thickness of 0.80 plus 5 mils (3.80 plus 0.50 mils for Vinyl Plastisol) for a total dry film thickness of 1.00 plus 0.10 mils (4.00 plus 0.10 mils for Vinyl Plastisol). This finish coat must be oven-cured.

d. Interior Finish Coating: Apply a wash-coat on the reverse side over the primer by roll coating to a dry film thickness of 0.30 plus 0.05 mils for a total dry film thickness of 0.50 plus 0.10 mils. The wash-coat must be oven-cured.

e. Color: The exterior finish to match color as indicated in Section 09 06 90.01 00 COLOR SCHEDULE.

f. Physical Properties: Coating must conform to the industry and manufacturer's standard performance criteria as listed by the following certified test reports:

Chalking:	ASTM D4214
Color Change and Conformity:	ASTM D2244
Weatherometer:	ASTM G152, ASTM G153 and ASTM D822
Humidity:	ASTM D2247 and ASTM D714

Salt Spray:	ASTM B117
Chemical Pollution:	ASTM D1308
Gloss at 60:	ASTM D523
Pencil Hardness:	ASTM D3363
Reverse Impact:	ASTM D2794
Flexibility:	ASTM D522/D522M
Abrasion:	ASTM D968
Flame Spread:	ASTM E84
Adhesion	ASTM D3359

2.2 FASTENERS

2.2.1 General

Fasteners for wall panel trims to be of type, material, corrosion resistance, size and sufficient length to penetrate the supporting member a minimum of 1 inch with other properties required to fasten to substrates in accordance with the wall panel manufacturer's and ASCE 7 requirements.

2.2.2 Exposed Fasteners

Fasteners for wall panels to be corrosion resistant coated steel, stainless steel, or nylon capped steel compatible with the sheet panel or flashing and of a type and size recommended by the manufacturer to meet the performance requirements and design loads. Fasteners for accessories to be the manufacturer's standard. Provide an integral metal washer matching the color of attached material with compressible sealing EPDM gasket approximately 3/32 inches thick.

2.2.3 Screws

Screws to be corrosion resistant coated steel and/or stainless steel being the type and size recommended by the manufacturer to meet the performance requirements.

2.2.4 Rivets

Rivets to be closed-end type, corrosion resistant coated steel, or stainless steel where watertight connections are required.

2.2.5 Attachment Clips

Fabricate clips from steel hot-dipped galvanized in accordance with ASTM A653/A653M, or Series 300 stainless steel. Size, shape, thickness and capacity as required meeting the insulation thickness and design load criteria specified.

2.2.6 Fiberglass Bolts

Provide fiberglass bolts machined from pultruded fiberglass vinyl ester rods and thermoplastic nuts with UV inhibitors providing minimum 60,000psi longitudinal compressive strength per ASTM D695 and minimum 50,000psi flexural strength with ASTM D790.

AM#10... ...AM#10

2.3 ACCESSORIES

2.3.1 General

All accessories to be compatible with the metal wall panels. Sheet metal flashing, trim, metal closure strips, parapet caps and similar metal accessories must not be less than the minimum thickness specified for the wall panels. Exposed metal accessories/finishes to match the panels furnished, except as otherwise indicated.

2.3.2 Metal Closure Strips

Factory fabricated steel closure strips to be the same thickness, color, finish and profile of the specified wall panel.

2.3.3 Joint Sealants

2.3.3.1 Sealants and Caulking

Sealants are to be an approved gun type for use in hand- or air-pressure caulking guns at temperatures above 40 degrees F (or frost-free application at temperatures above 10 degrees F) with minimum solid content of 85 percent of the total volume. Sealant is to dry with a tough, durable surface skin which permits it to remain soft and pliable underneath, providing a weather-tight joint. No migratory staining is permitted on painted or unpainted metal, stone, glass, vinyl, or wood.

Prime all joints to receive sealants with a compatible one-component or two-component primer as recommended by the wall panel manufacturer.

2.3.3.2 Shop-Applied

Sealant for shop-applied caulking must be an approved gun grade, non-sag one component butyl conforming to ASTM C1311 and with a curing time to ensure the sealant's plasticity at the time of field erection.

2.3.3.3 Field-Applied

Sealant for field-applied caulking must be an approved gun grade, non-sag one component conforming to ASTM C1311 at concealed joints and single components silicone conforming to ASTM C920, Type S, Grand NS, Class 50 NT. Color to match panel colors. Color to match panel colors.

2.3.3.4 Tape Sealant

Pressure sensitive, 100 percent solid with a release paper backing; permanently elastic, non-sagging, non-toxic and non-staining as approved by the wall panel manufacturer.

2.4 SHEET METAL FLASHING AND TRIM

2.4.1 Fabrication

Shop fabricate sheet metal flashing and trim where practicable to comply with recommendations in SMACNA 1793 that apply to design, dimensions, metal, and other characteristics of item indicated. Obtain field measurements for accurate fit before shop fabrication.

Fabricate sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.

2.5 REPAIR OF FINISH PROTECTION

Repair paint for color finish enameled wall panel must be compatible paint of the same formula and color as the specified finish furnished by the wall panel manufacturer.

2.6 CANOPIES

Fabricate canopies for field installation. Coordinate bracket placement during panel installation and supports to ensure that canopy installation has no adverse effect on panel performance in terms of structural, water or air penetration.

2.6.1 Materials

Decking shall consist of an interlocking roll-formed 2 3/4 4 extruded .078" decking. Intermediate framing members shall be extruded aluminum, alloy 6063-T6, in profile and thickness per manufacturer's recommendation. Hanger rods and attachment hardware shall be manufacturer's recommendation and standard finish. Fascia shall be standard 8 extruded J style (minimum .125 aluminum) or optional 8 K style (minimum .032 aluminum.) Provide fiberglass bolts machined from pultruded fiberglass vinyl ester rods and thermoplastic nuts as indicated on drawings.

2.6.2 Fabrication

Canopies are shipped in preassembled sections for ease of installation. All connections shall be mechanically assembled utilizing 3/16 fasteners with a minimum shear stress of 350 lb. Pre-welded or factory-welded connections are not acceptable. Decking shall be designed with interlocking roll-formed aluminum members. Canopies shall provide a concealed drainage system to direct water to drain from covered surfaces into intermediate trough and be directed to the front for scupper drainage as indicated on drawings.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal wall panel supports, and other conditions affecting performance of the Work.

B. Examine primary and secondary wall framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by

metal wall panel manufacturer, UL, ASTM, ASCE 7 and as required for the geographical area where construction will take place.

C. Submit to the Contracting Officer a written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of substances harmful to insulation, including removing projections capable of interfering with insulation attachment.

3.3 WALL PANEL INSTALLATION

Provide metal wall panels of full length from sill to eave as indicated, unless otherwise indicated or restricted by shipping limitations. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement in accordance with MBMA Metal Building Systems Manual.

a. Steel Wall Panels: Use stainless-steel fasteners for exterior surfaces and galvanized steel fasteners for interior surfaces.

b. Anchor Clips: Anchor metal wall panels and other components of the Work securely in place, using manufacturer's approved fasteners according to manufacturer's written instructions.

c. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal wall panel manufacturer.

d. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal wall panel assemblies. Provide types of gaskets, fillers, and sealants indicated or, if not indicated, types recommended by metal wall panel manufacturer.

Erect wall panel system in accordance with the approved erection drawings, the printed instructions and safety precautions of the manufacturer.

Sheets are not to be subjected to overloading, abuse, or undue impact. Bent, chipped, or defective sheets shall not be applied.

Sheets must be erected true and plumb and in exact alignment with the horizontal and vertical edges of the building, securely anchored, and with the indicated eave, and sill.

Work is to allow for thermal movement of the wall panel, movement of the building structure, and to provide permanent freedom from noise due to wind pressure.

Field cutting metal wall panels by torch, reciprocating saw, or abrasive cutting wheel is not permitted.

3.4 CANOPY INSTALLATION

3.4.1 Inspection

Confirm that surrounding area is ready for the canopy installation. Installer shall confirm dimensions and elevations to be as shown on approved shop drawings. Erection shall be performed by an approved installer and scheduled after all concrete, masonry and roofing in the area is completed.

3.4.2 General

Comply with manufacturer's written instructions. Refer to installation instructions of the wall panel system. Do not install damaged components. Fit joints to produce hairline joints free of burrs and distortion. Rigidly secure non-movement joints. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints. Weld components in concealed locations to minimize distortion or discoloration of finish. Protect surfaces from welding. Seal joints watertight where shown on approved shop drawings and/or manufacturer's standard installation instructions.

3.4.3 Metal Protection

Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape or installing nonconductive spacers as recommended by manufacturer for this purpose. Install components plumb and true in alignment with established lines and grades. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

3.4.4 Adjusting, Cleaning and Protection

Protect installed product's finish surfaces from damage during construction. Protect aluminum canopy system from damage from grinding and polishing compounds, plaster, lime, cement, acid and/or acid wash, or other harmful contaminants. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions. Remove and legally dispose of debris construction debris from project site.

3.5 FASTENER INSTALLATION

Anchor metal wall panels and other components of the Work securely in place, using manufacturer's approved fasteners according to manufacturer's written instructions.

3.6 FLASHING, TRIM AND CLOSURE INSTALLATION

3.6.1 General Requirements

Comply with performance requirements, manufacturer's written installation instructions, and SMACNA 1793. Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

Sheet metalwork is to be accomplished to form weather-tight construction without waves, warps, buckles, fastening stresses or distortion, and allow for expansion and contraction. Cutting, fitting, drilling, and other

operations in connection with sheet metal required to accommodate the work of other trades is to be performed by sheet metal mechanics.

3.6.2 Metal Flashing

Exposed metal extrusions and flashing are to be installed at building corners, sills and eaves, junctions between metal siding and walls.

Exposed metal flashing is to be the same material, color, and finish as the specified metal wall panel.

Flashing is to be fastened at not more than 8 inches on center, except where flashing are held in place by the same screws that secure covering sheets.

Flashing is to be furnished in at least 8 foot lengths. Exposed flashing is to have 4 inch bayonette expansion joints at intervals of not more than 16 feet.

Exposed flashing and flashing subject to rain penetration to be bedded in the specified joint sealant.

Flashing which is in contact with dissimilar metals to be isolated by means of the specified asphalt mastic material to prevent electrolytic deterioration.

Drips to be formed to the profile indicated, with the edge folded back 1/2 inch to form a reinforced drip edge.

3.6.3 Closures

Install metal closure strips at open ends of corrugated or ribbed pattern walls, and at intersection of wall and wall unless open ends are concealed with formed eave flashing; and in other required areas.

Install mastic closure strips at intersection of the wall with metal walling; top and bottom of metal siding; heads of wall openings; and in other required locations.

3.7 WORKMANSHIP

Make lines, arises, and angles sharp and true. Free exposed surfaces from visible wave, warp, buckle, and tool marks. Fold back exposed edges neatly to form a 1/2 inch hem on the concealed side. Make sheet metal exposed to the weather watertight with provisions for expansion and contraction.

Make surfaces to receive sheet metal plumb and true, clean, even, smooth, dry, and free of defects and projections which might affect the application. For installation of items not shown in detail or not covered by specifications conform to the applicable requirements of SMACNA 1793. Provide sheet metal flashing in the angles formed where roof decks abut walls, curbs, ventilators, pipes, or other vertical surfaces and wherever indicated and necessary to make the work watertight.

3.8 ACCEPTANCE PROVISIONS

3.8.1 Erection Tolerances

Erect metal wall panels straight and true with plumb vertical lines

correctly lapped and secured in accordance with the manufacturer's written instructions. Horizontal lines must not vary more than 1/8 inch in 40 feet.

3.8.2 Water Leakage Tests

Finished application of metal wall panels are to be subject to inspection and test for leakage by the Contracting Officer, Architect/Engineer. Inspection and tests will be conducted without cost to the Government.

Inspection and testing is to be made promptly after erection to permit correction of defects and the removal and replacement of defective materials.

Test two bays in accordance with AAMA 501.2.

3.8.3 Repairs to Finish

Scratches, abrasions, and minor surface defects of finish may be repaired with the specified repair materials. Finished repaired surfaces must be uniform and free from variations of color and surface texture.

Repaired metal surfaces that are not acceptable to the project requirements are to be immediately removed and replaced with new material.

3.8.4 Paint-Finish Metal Siding

Paint-finish metal siding will be tested for color stability by the Contracting Officer during the manufacturer's specified guarantee period.

Panels that indicate color changes, fading, or surface degradation, determined by visual examination, must be removed and replaced with new panels at no expense to the Government.

New panels will be subject to the specified tests for an additional year from the date of their installation.

3.9 CLEAN-UP AND DISPOSAL

Clean all exposed sheet metal work at completion of installation.

Remove metal shavings, filings, nails, bolts, and wires from work area.

Remove grease and oil films, excess sealants, handling marks, contamination from steel wool, fittings and drilling debris and scrub the work clean.

Exposed metal surfaces to be free of dents, creases, waves, scratch marks, solder or weld marks, and damage to the finish coating.

Collect and place scrap/waste materials in containers. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site; transport demolished materials from government property and legally dispose of them.

-- End of Section --